

WHAT IS CLAIMED IS:

1. A method for stably transfecting mammalian primary natural killer cells comprising:

transfecting a packaging cell line with a retroviral expression vector;

culturing the transfected packaging cell line in a cell culture medium; and

culturing the mammalian natural killer cells with the cell culture medium;

wherein the transfected mammalian natural killer cells express an exogenous gene for at least two population doublings.
2. The method according to claim 1, wherein the packaging cell line is chosen from a Phoenix cell line.
3. The method according to claim 2, wherein the packaging cell line is Phoenix-Ampho.
4. The method according to claim 1, wherein the retroviral expression vector is PINCO.
5. The method according to claim 1, further comprising separating the transfected packaging cell line from the cell culture medium in which the cell line is cultured prior to culturing the mammalian natural killer cells with the cell culture medium.
6. The method according to claim 1, wherein the transfected mammalian natural killer cells include both CD56^{bright} and CD56^{dim} cell subsets.
7. The method according to claim 1, wherein the vector comprises cDNA of greater than about 2 kB.
8. The method according to claim 7, wherein the vector comprises cDNA of greater than about 3 kB.

9. The method according to claim 8, wherein the vector comprises cDNA of greater than or equal to about 3.8 kB.
10. The method according to claim 9, wherein the vector comprises cDNA of greater than about 4 kB.
11. A non-naturally occurring mammalian CD56^{dim} natural killer cell which expresses an exogenous protein of interest and at least one of green fluorescent protein and CD8.
12. A progeny cell line of the non-naturally occurring mammalian natural killer cell according to claim 11.
13. A non-naturally occurring mammalian natural killer cell line, which expresses a protein of interest through at least two population doublings.
14. The non-naturally occurring mammalian natural killer cell line according to claim 13, which expresses the protein of interest through at least four population doublings.
15. The non-naturally occurring mammalian natural killer cell line according to claim 14, which expresses the protein of interest through at least eight population doublings.